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EXAMINER	
CHOW, CHARLES CHIANG	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/040,857	WHIKEHART ET AL.	
	Examiner	Art Unit	
	Charles Chow	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 November 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4-4/02; 5-11/02*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Detailed Action

Specification

1. The disclosure is objected to because of the following informalities: In [0027], "the second mixer circuit 214" is incorrect, because the second mixer circuit should be "216" instead of "214". Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 17-18, 22, 24, 28-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Baltus et al. (US 5,887,247).

Regarding **claim 17**, Baltus et al. (Baltus) teaches method for beam steering control in a vehicle radio receiver (the mobile phone, car radio in col. 1, lines 8-17 and col. 3, lines 56-65; the updating fixed beam with scanned beam in abstract; the scanning antenna 4 for resetting, updating, fixed antenna beam-pattern, abstract, col. 2, lines 1-42, Fig. 2-4, mobile, car radio in col. 1, lines 8-16), generating a receiver signal in response to a first radio signal and a second radio signal, where the receiver signal has a receiver signal quality (the output of combiner 23 is a receiver signal which is generated by combining a first radio signal from fixed antenna 3 with a second radio signal from antenna 4 via variable phase shift 24) where the receiver signal has a receiver signal quality (the receiver signal 30 is evaluated for signal quality, SNIR, at quality circuit 29, col. 4, lines 36-49), generating a test signal in response to a first test steering solution (the generating a test signal at the output of combiner 25 in

response to the control circuit 28 to switch over to scanning mode, when quality of the fixed beam is lower then the scanning beam, col. 6, line 41 to col. 7, line 8; the first steering solution at the output of combiner 25 which is determined by the determining circuit 29 to digital control 28 for switching over from a beam receiving mode to a beam scanning mode in col. 4, lines 6, lines 6-47), where the first test steering solution represents a proportion of the first and second radio signals in the test signal (in the scanning mode, the steering solution at the output of combiner 25 determined by 29 comprising the proportional of the first radio signal, from fixed antenna 3 and the second radio signal from scanning antenna 4, in the test signal for outputting to determining circuit 29 via 31, Fig. 2; col. 4, lines 21-49; col. 4, lines 36-49; next quality in steps 134 for looping back to step 133 in Fig. 10), resetting the receiver signal in response to the first test steering solution when the test signal quality exceeds the receiver signal quality (resetting, updating, the fixed beam in response to the first test steering solution determined by determining circuit 29 to switch over at 27, for the combined signal at the output of combiner 25 having better test quality, SNIR, BER, than receiver signal quality at the output of 30, col. 2, lines 35-42, abstract; the updating beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65).

Regarding **claim 18**, Baltus teaches the first and second radio signals comprising radio frequency RF signals at antennas 3, 4 for mobile phone (col. 3, lines 63-63; for TDMA, CDMA, in coll. 3, lines 7-14).

Regarding **claim 22**, Baltus teaches selecting a second test steering solution, generating a

new test signal in response to the second test steering solution, the new test signal having a new test signal quality (the scanned quality is not better in step 133, the performing next scan direction & quality in step 134 and returning to step 133 for re-evaluating scan-better, Fig. 10, col. 7, lines 19-38).

Regarding **claim 24**, Baltus teaches a method for bean steering control in a vehicle radio receiver (the mobile phone, car radio in col. 1, lines 8-17 and col. 3, lines 56-65; the updating fixed beam with scanned beam in abstract), generating a receiver signal in response to a first radio signal and a second radio signal (the combiner 5 for combining phase shifted radio signal from scanning antenna 4 with the radio signal from fixed antenna 3, Fig. 2), measuring a receiver quality of the received signal (step 132, Fig. 10), generating a first test steering solution in response to the first radio signal; measuring a first test signal quality of the first test signal responsive to the first test steering solution (the quality circuit 29 evaluating quality of 30 having the first fixed antenna signal; the generating first test steering when step 132, Fig. 10, determines better SNIR to perform swap beam 1 and beam 2 in step 135; otherwise, to move to nest scan direction & quality at step 134, Fig. 10), resetting the receiver in response to the first test steering solution when the first test signal quality exceed the receiver signal quality (updates the beam for receiving mode with beam found in scanning mode in col. 2, lines 35-42, abstract; the updating beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65).

Regarding **claim 28**, Baltus teaches generating a second test steering solution in response to

the second radio signal (the phase shifted second scanning signal from phase shift 26 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27), measuring a second test signal quality of a second test signal responsive to the second test steering solution (the next scan direction & quality in step 132), the resetting the receiver signal in response to the second test steering solution when the second test quality exceeds the receiver signal quality ("the scan better ?" of the second test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135, otherwise move to next scan direction & test quality in step 134).

Regarding **claim 29**, Baltus teaches generating a third test steering solution in response to the first and second radio signals (the combined signal at combiner 25 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27), measuring a third test signal quality of a second test signal responsive to the third test steering solution (the next scan direction & quality in step 132), the resetting the receiver signal in response to the third test steering solution when the third test quality exceeds the receiver signal quality (in the loop of 133, 134, "the scan better ?" of the third test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135; otherwise move to next scan direction & test quality in step 134).

Regarding **claim 30**, Baltus teaches generating a new test steering solution in response to the first and second radio signals (the combined signal at combiner 25 for continuously generating second test steering solution in steps 13, 134 Fig. 10; the continuous scanning in col. 2, lines 22-27), measuring a new test signal quality of a second test signal responsive to the third test steering solution (the next scan direction & quality in step 132), the resetting the

receiver signal in response to the new test steering solution when the third test quality exceeds the receiver signal quality (in the loop of 133, 134, "the scan better ?" of the third test steering in step 133, if it is better quality, swap beam 1 and beam 2 in step 135; otherwise move to next scan direction & test quality in step 134).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-2, 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein (US 3,864,633) in view of Baltus et al. (US 5,887,247).

Regarding **claim 1**, Strenglein teaches a radio receiver (space diversity receiving system in Fig. 6) comprising a first mixer circuit (hybrid circuit 60) operable to generate a receiver signal from first and second signals (hybrid circuit 61 receiving down converted signal from power divider 55 and power divider 54 via phase shifter 57, Fig. 6), the receiver signal characterized by a receiver signal quality (hybrid circuit 60, 61 to produce sum, difference signals 62, 63, 64, 65 to diversity translator 66 for evaluating of best signal to noise characteristics, col. 5, lines 56-65, maximize reception signal to noise ratio), and a second mixer circuit (hybrid 60) operable to generate a test signal from a different combination of the first and second signals (the readjusting signal to noise ratio by scanning phase shift 58 for better signal to noise ratio from sum, difference signals 62, 63, col. 5, lines 44-65; col. 9,

lines 1-19), the test signal characterized by a test signal quality (the evaluation of signal to noise ratio performed by diversity selector 66 for the sum, difference signals 62-65, produced by scanning the shift shifter scanners 57-58 in col. col. 5, lines 56-65; the automatic steering of the reception pattern in col. 2, lines 12-26; the spaced antenna in col. 2, lines 16-17).

Strenglein fails to teach the vehicle radio, the first mixer circuit is operable to reset the combination of the first and second signals. However, Baltus et al. (Baltus) teaches the mobile car radio (mobile, car radio, GPS in col. 1, lines 8-16), the first mixer circuit is operable to reset the combination of the first and second signals for the receiver signal in response to the test signal when the test signal quality exceeds the receiver signal quality (the scanning of antenna 4 for generating new combined antenna signals at combiner 25, for testing the best signal-to-noise-interference-ratio SNIR to update, reset, antenna pattern of the fixed antenna 3 with scanned antenna beam-pattern in abstract, col. 2, lines 10-42; Fig. 10; col. 7, lines 41-65, col. 2, lines 11-27; the combiner 23, 25 for combining received signals from fixed antenna 3 and scanning antenna 4 in Fig. 2-4 and col. 4, lines 12-49; the scanning physical angle is converted to electrical phase angel in col. 1, line 2-8; the one antenna in receive-mode, other in scanning mode for better beam for interchange, update, the beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65; the antenna pattern is depending upon the physical angle shifted at the antenna). Baltus teaches the improved technique for mobile radio for efficiently steering antenna by utilizing a scanning antenna beam to update the fixed reception antenna for best signal quality (col. 1, line 21 to

col. 2, line 27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein with Baltus's resetting, updating, fixed antenna beam-pattern with scanned antenna beam pattern for best reception beam, such that the car radio could receive the best signal .

Regarding **claim 2**, Strenglein teaches a second mixer circuit (hybrid 60) operable to generate a test signal from a different combination of the first and second signals (the readjusting signal to noise ratio by scanning phase shift 58 for better signal to noise ratio from sum, difference signals 62, 63, col. 5, lines 44-65; col. 9, lines 1-19), the test signal characterized by a test signal quality (the evaluation of signal to noise ratio performed by diversity selector 66 for the sum, difference signals 62-65, produced by scanning the shift shifter scanners 57-58 in col. col. 5, lines 56-65; the automatic steering of the reception pattern in col. 2, lines 12-26; the spaced antenna in col. 2, lines 16-17).

Baltus teaches the mobile car radio (mobile, car radio, GPS in col. 1, lines 8-16), the first mixer circuit is operable to reset the combination of the first and second signals for the receiver signal in response to the test signal when the test signal quality exceeds the receiver signal quality (the scanning of antenna 4 for generating new combined antenna signals at combiner 25, for testing the best signal-to-noise-interference-ratio to update, reset, antenna pattern of the fixed antenna 3 with scanned antenna beam-pattern in abstract, col. 2, lines 10-42; Fig. 10; col. 7, lines 41-65, col. 2, lines 11-27; the combiner 23, 25 for combining received signals from fixed antenna 3 and scanning antenna 4 in Fig. 2-4 and col. 4, lines 12-49; the scanning physical angle is converted to electrical phase angel in col. 1, line 2-8; the one antenna in receive-mode, other in scanning mode for better beam for interchange, update,

the beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65; the antenna pattern is depending upon the physical angle shifted at the antenna). Baltus teaches the improved technique for mobile radio for efficiently steering antenna by utilizing a scanning antenna beam to update the fixed reception antenna for best signal quality (col. 1, line 21 to col. 2, line 27).

Regarding **claim 6**, Strenglein teaches a first tuner operable to generate the first signal from a first radio frequency RF signal (the mixer 50, the IF amplifier 52 for generating first signal from antenna 10, Fig. 6); and a second tuner operable to generate the second signal from a second radio frequency RF signal (the mixer 51, the IF amplifier 53 for generating second signal from antenna 22, Fig. 6), where the first tuner is configured to receive the first RF signal from a first antenna (antenna 10), where the second tuner is configured to receive the second RF signal from a second antenna (11), where the first and second antenna are disposed at different positions (the spaced antennas in col. 2, lines 16-17).

4. Claims 3, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein in view of Baltus, and further in view of Wildhagen (US 2002/0168,955 A1).

Regarding **claim 3**, Strenglein and Baltus fail to teach the FM in about 88 MHz through about 108 MHz. However, Wildhagen teaches the first and second RF signals comprising FM signals in range of about 88 MHz through about 108 MHz ([0012, 0019-0020, 0025], Fig. 1-2), for improving the multipath distortion of the received broadcast signal (abstract), having combined antenna weight adjustment based on the field strength and

quality Q1-Q2, of the difference, sum signal (Fig. [0009-0013], for reducing the noise and multipath distortion in FM frequency band (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein above with Wildhagen's improving multipath distortion of the received signal from FM frequency band, such that the radio could receive better FM signal with less multipath distortion.

Regarding **claim 7**, Strenglein teaches the at least one receiver signal quality and the test signal quality comprising signal noise (the signal to noise in abstract, col. 5, lines 44-65). Wildhagen teaches the at least one signal strength (the control unit 4 receives two signal strength for determining of the variable weight for summed, difference signals [0018-0019].

5. Claims 4, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein in view of Baltus, Wildhagen and further in view of Kuo et al. (US 6,064,865).

Regarding **claim 4**, Strenglein, Baltus, Wildhagen fail to teach the radio data signals RDS. However, Kuo teaches the first and second rf signals comprise RDS signals (decoding of RDs signals at RDS decoder 34, from the signal output of summer 32, col. 3, lines 40-43, Fig. 5), the steering antenna weight for combining signals from antennas 24, 25 having tuners 27-28 and the generating new antenna pattern (Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18), the antenna configuration 45, the noise modification control 44 (Fig. 5), the combining MPX signal at summer 32. Kuo teaches a proportional diversity system for improving the reception signal by reducing the adjacent channel, co-channel interference (col. 1, line 22 to col. 2, line 9). Therefore, it would have been obvious to one of ordinary

skill in the art at the time of invention to modify Strenglein above with Kuo's RDS signal, such that receiver could receive better RDS information.

Regarding **claim 8**, Kuo teaches the signal processing circuit connected to the first mixer circuit, the signal processing circuit operable to generate an audio signal in response to the receiver signal (the audio processor 35 in Fig. 5, for producing stereo audio, col. 3, lines 43-49).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Strenglein in view of Baltus, and further in view of Kuo et al.-'865.

Regarding **claim 5**, Strenglein, Baltus, fail to teach the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal. However, Kuo teaches the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal (the down converted IF signals from tuner 27-28, Fig. 5, the combining of MPX signals at combiner 32), the steering antenna weight for combining signals from antennas 24, 25 having tuners 27-28 and the generating new antenna pattern (Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18), the antenna configuration 45, the noise modification control 44 (Fig. 5), the combining MPX signal at summer 32. Kuo teaches a proportional diversity system for improving the reception signal by reducing the adjacent channel, co-channel interference (col. 1, line 22 to col. 2, line 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein above with Kuo's RDS signal, such that receiver could receive better RDS information.

7. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welles, II et al. (US 6,577,353 B1) in view of Baltus-'247.

Regarding **claim 9**, Welles II et al. (Welles) teaches a first mixer circuit operable to generate a radio rf receiver signal characterized by receiver steering solution, the receiver steering solution representing a proportion of a first and a second rf signal in the rf receiver signal (the combiner 104 for combing antenna signals from antennas 101-103, Fig. 1, for connecting output signal to ATSC tuner 108; for steering, selecting, antenna combination having strongest combined signal in abstract, with the antenna proportional signal control via attenuation, and phase control of the rf signal as shown in Fig. 2-3), a second mixer circuit operable to generate an rf combined signal representing a proportion of a first and a second rf signal in the rf receiver signal (the combiner 105 for combining antenna signals from antennas 101-103 with proportion attenuation, phase control, Fig. 1-3), the first tuner (108) is connected to the first mixer (104) to generate a receiver signal in response to the rf receiver signal, having receiver quality (evaluation module 111 for measure the signal strength, quality in col. 4, line 63 to col. 5, line 14), the second tuner (109) is connected to the first mixer (105) to generate a receiver signal in response to the rf receiver signal, having receiver quality (evaluation module 111 for measure the signal strength, quality in col. 4, line 63 to col. 5, line 14),

Welles fails to teach the vehicle radio receiver, the reset the rf receiver to the test steering solution when the test signal quality exceed the receiver quality. However, Baltus teaches the

vehicle radio receiver (mobile, car radio in col. 12, lines 8-16, col. 3, lines 56-65), the second mixer for generating test signal via the scanning antenna 4, the phase shift 26. Baltus teaches the first mixer circuit is operable to reset rf receiver in response to the test steering solution when the test signal quality exceeds the receiver signal quality (the scanning of antenna 4 for generating new combined antenna signals at combiner 25, for testing the best signal-to-noise-interference-ratio SNIR to update, reset, antenna pattern of the fixed antenna 3 with scanned antenna beam-pattern in abstract, col. 2, lines 10-42; Fig. 10; col. 7, lines 41-65, col. 2, lines 11-27; the combiner 23, 25 for combining received signals from fixed antenna 3 and scanning antenna 4 in Fig. 2-4 and col. 4, lines 12-49; the scanning physical angle is converted to electrical phase angel in col. 1, line 2-8; the one antenna in receive-mode, other in scanning mode for better beam for interchange, update, the beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65; the antenna pattern is depending upon the physical angle shifted at the antenna). Baltus teaches the improved technique for mobile radio for efficiently steering antenna by utilizing a scanning antenna beam to update the fixed reception antenna for best signal quality (col. 1, line 21 to col. 2, line 27). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Welles with Baltus's resetting, updating, fixed antenna beam-pattern with scanned antenna beam pattern for best reception beam, such that the car radio could receive the best signal .

Regarding **claim 10**, Baltus teaches a second mixer circuit (25) operable to generate a test signal from a different combination of the first and second signals (the generating new rf signal combination by scanning antenna 4 from combiner 25), the test

signal characterized by a test signal quality (the new, next scan direction, quality, step 134, is evaluated by quality circuit 29). Baltus teaches the mobile car radio (mobile, car radio, GPS in col. 1, lines 8-16), the first mixer circuit is operable to reset the combination of the first and second signals for the receiver signal in response to the test signal when the test signal quality exceeds the receiver signal quality (the scanning of antenna 4 for generating new combined antenna signals at combiner 25, for testing the best signal-to-noise-interference-ratio to update, reset, antenna pattern of the fixed antenna 3 with scanned antenna beam-pattern in abstract, col. 2, lines 10-42; Fig. 10; col. 7, lines 41-65, col. 2, lines 11-27; the combiner 23, 25 for combining received signals from fixed antenna 3 and scanning antenna 4 in Fig. 2-4 and col. 4, lines 12-49; the scanning physical angle is converted to electrical phase angel in col. 1, line 2-8; the one antenna in receive-mode, other in scanning mode for better beam for interchange, update, the beam pattern in col. 4, lines 44-49; the determining of the signal quality, SNIR, BER in col. 6, lines 6-31; the interchange the receiving beam pattern in col. 6, lines 41-65; the antenna pattern is depending upon the physical angle shifted at the antenna).

8. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Welles in view of Baltus, and further in view of Wildhagen-'955 A1.

Regarding **claim 11,** Welles and Baltus fail to teach the FM frequency band about 88-108 Mhz. HoweverWildhagen teaches the first and second RF signals comprising FM signals in range of about 88 MHz through about 108 MHz ([0012, 0019-0020, 0025], Fig. 1-2), for improving the multipath distortion of the received broadcast signal (abstract), having

combined antenna weight adjustment based on the field strength and quality Q1-Q2, of the difference, sum signal (Fig. [0009-0013], for reducing the noise and multipath distortion in FM frequency band (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Welles above with Wildhagen's improving multipath distortion of the received signal from FM frequency band

9. Claims 12-13, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welles in view of Baltus, and further in view of Kuo-'865.

Regarding **claim 12,** Welles and Baltus fail to teach the IF frequency and MPX. However, Kuo teaches the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal (the down converted IF signals from tuner 27-28, Fig. 5, the combining of MPX signals at combiner 32), the steering antenna weight for combining signals from antennas 24, 25 having tuners 27-28 and the generating new antenna pattern (Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18), the antenna configuration 45, the noise modification control 44 (Fig. 5), the combining MPX signal at summer 32. Kuo teaches a proportional diversity system for improving the reception signal by reducing the adjacent channel, co-channel interference (col. 1, line 22 to col. 2, line 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Welles above with Kuo's RDS signal, such that receiver could receive better RDS information.

Regarding **claim 13**, Kuo teaches the first and second rf signals comprise RDS signals

(decoding of RDs signals at RDS decoder 34, from the signal output of summer 32, col. 3, lines 40-43, Fig. 5), the steering antenna weight for combining signals from antennas 24, 25 having tuners 27-28 and the generating new antenna pattern (Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18),

Regarding **claim 16**, Kuo teaches the signal processing circuit connected to the first mixer circuit, the signal processing circuit operable to generate an audio signal in response to the receiver signal (the audio processor 35 in Fig. 5, for producing stereo audio, col. 3, lines 43-49).

10. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Welles in view of Baltus, and further in view of Strenglein-'633.

Regarding **claim 14,** Welles teaches the first and second mixers (104, 105) are configured to receive the first rf signal from the first antenna (101) and the second rf signal from a second antenna (102). Welles and Baltus failed to teach the antennas disposed at different positions. However, Strenglein teaches the first and second antennas are disposed at different positions (spaced apart antennas in col. 2, lines 16-17). Strenglein teaches the improved method for automatic steering of antennas with new antenna phase angle for best reception to avoid signal fading (col. 1, line 56 to col. 2, line 26). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Welles with Strenglein's improved reception with automatic antenna steering, such that the receiver could have better reception signal by avoiding multipath fading.

Regarding **claim 15,** Welles teaches the at least one of the receiver signal quality (the evaluation module for determining the best signal strength, abstract, col. 4, line 63 to col. 5, line 14). Baltus teaches the test signal quality comprising at least one of a signal noise (the quality circuit 29 for evaluation of the signal to noise and interference ratio of the combined signal from the receiver 22 during scanning mode).

11. Claims 19, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baltus in view of Wildhagen-'955 A1.

Regarding **claim 19**, Wildhagen teaches the first and second RF signals comprising FM signals in range of about 88 MHz through about 108 MHz ([0012, 0019-0020, 0025], Fig. 1-2), for improving the multipath distortion of the received broadcast signal (abstract), having combined antenna weight adjustment based on the field strength and quality Q1-Q2, of the difference, sum signal (Fig. [0009-0013], for reducing the noise and multipath distortion in FM frequency band (abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein above with Wildhagen's improving multipath distortion of the received signal from FM frequency band, such that the radio could receive better FM signal with less multipath distortion.

Regarding **claim 25**, Wildhagen teaches the first and second RF signals comprising FM signals in range of about 88 MHz through about 108 MHz ([0012, 0019-0020, 0025], Fig. 1-2).

12. Claims 20-21, 23, 26-27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Baltus in view of Kuo-'865.

Regarding **claim 20**, Kuo teaches the rf signals comprise radio data service RDS signals. However, Kuo teaches the first and second rf signals comprise RDS signals (decoding of RDs signals at RDS decoder 34, from the signal output of summer 32, col. 3, lines 40-43, Fig. 5), the steering antenna weight for combining signals from antennas 24, 25 having tuners 27-28 and the generating new antenna pattern (Fig. 5, abstract; col. 1, lines 6-11; col. 4, lines 56 to col. 5, line 18), the antenna configuration 45, the noise modification control 44 (Fig. 5), the combining MPX signal at summer 32. Kuo teaches a proportional diversity system for improving the reception signal by reducing the adjacent channel, co-channel interference (col. 1, line 22 to col. 2, line 9). Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify Strenglein above with Kuo's RDS signal, such that receiver could receive better RDS information.

Regarding **claim 21,** Kuo teaches the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal (the down converted IF signals from tuner 27-28, Fig. 5, the combining of MPX signals at combiner 32.

Regarding **claim 23**, Kuo the generating audio signal in response to the receiver signal (the audio processor 35 in Fig. 5, for producing stereo audio, col. 3, lines 43-49).

Regarding **claim 26**, Kuo teaches the first and second signals comprise at least one of an intermediate frequency IF signal and a multiplex MPX signal (the down converted IF signals from tuner 27-28, Fig. 5, the combining of MPX signals at combiner 32.

Regarding **claim 27**, first and second rf signals comprise RDS signals (decoding

of RDS signals at RDS decoder 34, from the signal output of summer 32, col. 3, lines 40-43, Fig. 5).

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A. US 2004/0116,086 A1, Huttunen teaches the antenna A1, A2 for providing cross connected channel 1-2 signal to respective base band processor 1-2 (abstract, Fig. 2-4).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Chow whose telephone number is (703)-306-5615.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban, can be reached at (703)-305-4385.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Charles Chow C.C.

July 28, 2004.

EDWARD F. URBAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600